

Appl. No. 10/019,350
Amdt. dated June 9, 2004
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

Amendments to the Claims:

Please amend claims 1 and 16. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of epitaxially growing a material on a substrate, the method comprising separately heating at least first and second precursors having precursors, at least two of which have different decomposition temperatures, temperatures to their respective decomposition temperatures at or adjacent a region of the substrate to generate species which are supplied separately in a sequential manner to the region and which combine at the region, wherein the precursors are separately heated using first and second heating mechanisms, the first heating mechanism being heated in use to a first temperature so as to cause the decomposition of the first precursor, the second heating mechanism being heated in use to a second temperature, dissimilar to the first temperature, so as to cause the decomposition of the second precursor.
2. (Previously presented) A method according to claim 1, wherein the species are supplied separately to the region by the relative movement of the substrate to cause the movement of the region with respect to the locations at which decomposition of the precursors occurs.
3. (Previously presented) A method according to claim 1, wherein at least one precursor is supplied separately to the region as a gas stream.
4. (Previously presented) A method according to claim 1, wherein the species are chosen from the Group III and Group V elements.
5. (Previously presented) A method according to claim 1, wherein the species are chosen from the Group IV elements.

Appl. No. 10/019,350
Amdt. dated June 9, 2004
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

6. (Original) A method according to claim 4, wherein the species comprise Gallium and Nitrogen.

7. (Original) A method according to claim 5, wherein the species comprise Carbon and Silicon.

8. (Original) A method according to claim 6, wherein one of the precursors is ammonia.

9. (Previously presented) A method according to claim 1, wherein the substrate comprises a semiconductor such as Gallium-Arsenide.

10. (Previously presented) A method according to claim 1, wherein one of the precursors is heated to its decomposition temperature by heating the substrate.

11. (Original) A method according to claim 10, wherein the substrate is heated to the decomposition temperature of the precursor with the lower decomposition temperature.

12. (Previously presented) A method according to claim 10, wherein the substrate is heated to a temperature in the range 550-800°C.

13. (Previously presented) A method according to claim 1, wherein one of the precursors is heated to its decomposition temperature at a location adjacent the region.

14. (Original) A method according to claim 13, wherein the precursor is heated to a temperature in the range 400-1800°C.

15. (Previously presented) A method according to claim 1, further comprising moving the region across the substrate.

16. (Currently amended) Apparatus for epitaxially growing a material on a substrate, the apparatus comprising:

Appl. No. 10/019,350
Amdt. dated June 9, 2004
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

a chamber containing a substrate support, the chamber having a first inlet for supplying a first precursor and a second inlet, separate from the first inlet, for supplying a second precursor, the first and second precursors having different decomposition temperatures; and

first and second heating means for separately heating the first and second precursors to their respective decomposition temperatures at or adjacent a region of the substrate substrate, the first heating means being heated in use to a first temperature to cause the decomposition of the first precursor, the second heating means being heated in use to a second temperature, dissimilar to the first temperature, to cause the decomposition of the second precursor, so as to generate species which are supplied separately to the region and which combine at the region.

17. (Original) Apparatus according to claim 16, wherein the second inlet is formed in a supply conduit located adjacent the substrate support.

18. (Original) Apparatus according to claim 17, wherein the second inlet is in the form of an elongate slot.

19. (Previously presented) Apparatus according to claim 18, wherein the second heating means is provided in or adjacent the slot.

20. (Previously presented) Apparatus according to claim 16, wherein the second heating means is in the form of a heating wire.

21. (Previously presented) Apparatus according to claim 16, wherein the first heating means is located at a position to heat the substrate support.

22. (Previously presented) Apparatus according to claim 16, further comprising means for causing relative movement between the substrate support and at least one of the inlets.

23. (Previously presented) Apparatus according to claim 17, further comprising means for causing relative movement between the substrate support and at least one of the inlets,

Appl. No. 10/019,350
Amdt. dated June 9, 2004
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

wherein a plurality of supply conduits are provided for supplying the same or different precursors to regions on the substrate, the conduits and substrate support being relatively movable to bring the conduits into alignment with different regions.

24. (Original) Apparatus according to claim 23, wherein the supply conduits are arranged to supply precursors separately and sequentially to the region.

25. (Original) Apparatus according to claim 22 wherein the relative movement between the substrate support and at least one of the inlets is in a transverse manner.

26. (Original) Apparatus according to claim 22 wherein the relative movement between the substrate support and at least one of the inlets is in a rotational manner.

27. (Previously presented) A method according to claim 1, wherein the substrate comprises a semiconductor such as Silicon Carbide.

28. (Previously presented) A method according to claim 3, wherein the gas stream is arranged so as to form a gas shield to sweep away precursors or decomposition products not attached to the substrate

29. (Previously presented) Apparatus according to claim 20, wherein the heating wire is formed from a catalyst material.

30. (Previously presented) Apparatus for epitaxially growing a material on a substrate, the apparatus comprising:

a chamber containing a substrate support, the chamber having a first inlet for supplying a first precursor and a second inlet, separate from the first inlet, for supplying a second precursor, the first and second precursors having different decomposition temperatures; and first and second heating means for separately heating the first and second precursors to their respective decomposition temperatures at or adjacent a region of the substrate to generate species which are supplied separately to the region; and

Appl. No. 10/019,350
Amdt. dated June 9, 2004
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group

PATENT

means to supply the species in a sequential manner to the region such that the species combine at the region, wherein the means for supplying the species sequentially further comprises means for causing relative movement between the substrate support and at least one of the inlets.